

LOW-K DIELECTRIC MATERIAL SYSTEM FOR IC APPLICATION
ABSTRACT OF THE DISCLOSURE

A low-k dielectric for use as an interlayer for an interconnect structure is provided. The dielectric of the present invention is an alkaline boron silicate glass which when formulated in certain compositional ranges can undergo spinodal decomposition when processed using certain thermal profiles. Spinodal decomposition is a chemical and physical separation of the silicate glass into a distinct interpenetrating microstructure which contains a substantially pure silicon dioxide network and a boron-rich network. The dimension (i.e., scale), and the amount of separation can be controlled through compositional and thermal control during the processing of the silicate glass.